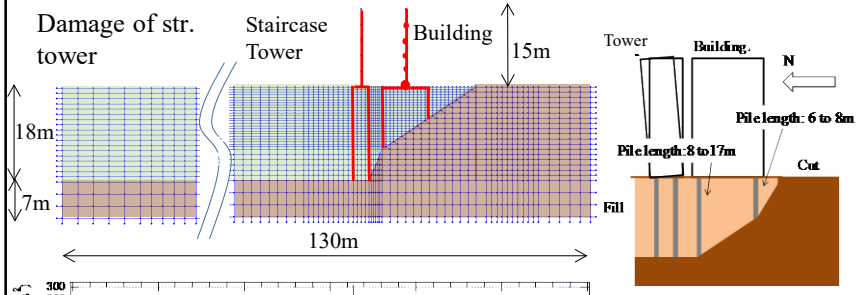
Dynamic behavior of a Pile-foundation building and its seismic design

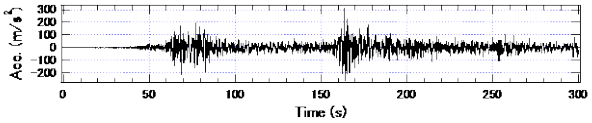
Professor Kazuya Mitsuji

Numerical simulation of a pile-foundation building heavily damaged by the 2011 Tohoku earthquake

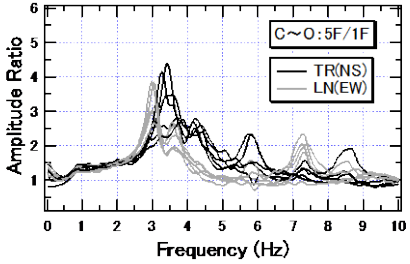
Sensors



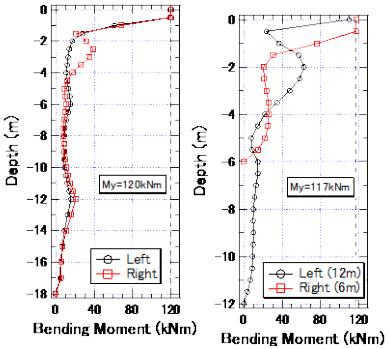
Schematic section



Numerical model of FEM



Amplitude ration of 5F/1F of the damaged building



Seismic response of piles

Content:

We conducted damage investigation of many pile-foundation buildings after the 2011 Tohoku earthquake. One of the important research topics of my laboratory is to understand dynamic behavior of a pile-foundation building with complicated ground conditions like irregular pile supporting stratum, soft soil characteristics, and so on. Based on the results of microtremor measurements, earthquake observations, and numerical simulations, we attempt to understand dynamic behavior of a pile-foundation building and contribute to refine the design technique of a pile-foundation building from the theoretical point of view.

We are also tackling with the study on vibration characteristics of "Yamagata Basin" which has complicated ground structure. In the western part of Yamagata Basin, soft soil layers are accumulated in subsurface layers and the engineering bedrock is supposed to be inclined. We try to find the vibration characteristics of Yamagata Basin by microtremor measurements. I'd like to mention that the effect of heavy snow load to the vibration characteristics of a building is also studied by long term monitoring.

Appealing point: Dynamics in geotechnical engineering and wooden structures are acceptable.

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